



United States
Department of
Agriculture

Forest
Service

Monongahela
National Forest

200 Sycamore Street
Elkins, WV 26241
(304) 636-1800

File Code: 1900/5100

Date: August 30, 2001

Route To: Assistant Forest Supervisors: Richard J. Cook & Kimberley Johnson

District Rangers: Pat A. Kowalewycz, Kenneth L. Rago, Marlinton/WS District Ranger, & Liz M. Schuppert

Subject: **Prescribed Fire Monitoring of Beulah Savannah**
Fiscal Year 2000 Review & Evaluation

To: Forest Supervisor

On August 7, 2000, five Monongahela National Forest personnel met to monitor the results of prescribed burning that has been conducted in the Beulah Savannah (**See summary on pages 17-20**). The following Forest Service personnel participated in this monitoring effort:

Name/Title

| | | |
|---|--|-----------------------|
| Richard Cook, Assistant Forest Supervisor | Harry Pawelczyk, Range Manager | Scott Wells, Forester |
| Laura Hise, Assistant Forest Planner | Gary Willison, Forest Planner & the Burn Boss for the 1999 Fire | |

Location

The Beulah Savannah resides in the headwaters of the West Fork of the Glady Fork River. It is in Randolph County, five miles south of Glady, WV, and 20 miles north of Durbin, WV. It can be reached by FR 44 to FR 338 then turning north onto the West Fork Trail^{*}; or taking SR 27 to the West Fork Trail at Glady and following it south. ^{*} All of the pictures in this report are courtesy of Harry Pawelczyk, Forest Range Program Manager.



Figure 1. West Fork Trail used to access the Beulah Savannah.

It is part of the Little Beech Mountain Opportunity Area (#36.103), governed by Management Prescription 6.1 guidelines to maintain vegetation for species in the Black Bear and Wild Turkey Associations (Forest Plan, pp. 164-165).

History of the Project

The Beulah Savannah contains Belmont silt loam and Calvin channery silt soils and is made up of approximately 345 acres. It is part of the 453 acres of open land that were purchased in 1934. Until the 1990s, approximately 201 acres of this open land was managed as the Gladly Range Allotment. Cattle and sheep grazed the allotment continuously from May 15 to October 15 each year in an effort to maintain grassy openings (see the Beulah 1995 Wildlife Management Plan).

Past monitoring indicated that livestock grazing, alone, was not adequately achieving vegetative objectives. The allotment had a history of being either under- or over-grazed. Over time, as with all open areas, grassland succeeded toward forest; hawthorn stands spread and became denser. St. John's Wort (a toxic weed) increased in the allotment. Also, livestock grazing was adversely affecting aquatic resources. Wetland and riparian vegetation were grazed down or trampled, and perennial stream channels eroded, silted, and widened.

In previous years, the West Virginia Division of Natural Resources (WVDNR) repaired fences so grazing could continue to be used to maintain this area in a non-forest condition. However, in the early 1990s, existing perimeter fences had deteriorated to the point that they needed to be replaced. Riparian fencing also was needed in the allotment to mitigate adverse impacts to wetland and riparian vegetation. The estimated cost of replacing fences and installing riparian fencing did not seem feasible given available range funding.

For these reasons, and the expectation that prescribed fire management would cost less than replacing the aging allotment fences, the allotment was converted to savannah management beginning about 1997.

Prescribed fire has been implemented in various portions of the savannah for the last three years (April 1998, April 1999, and April 2000)(see map in the project file*). The following table identifies the number of times and years that each area of the savannah have been burned:

| <i>Table A. The times and years different areas of the Beulah Savannah have been burned.</i> | | | |
|---|--|--------------------------|---------------------|
| Area* | Section | # Of Times Burned | Years Burned |
| Area 1 | Northwest section of the savannah | Twice | 1998 and 2000 |
| Area 2 | Middle and Northeast section of the savannah | Once | 1999 |
| Area 3 | Southern section of the savannah | Once | 1998 |

*The ID Team noted that the map that delineates the burned areas does not match conditions on the ground. A GPS unit should be used to map the perimeter of the savannah; delineate the open areas from the forested areas; and identify the areas that have been burned. This would enable the Forest to determine how fires over the years are affecting the size and shape of these areas.

A number of inter-related factors have made achieving a successful burn on the savannah challenging, but the number one limiting factor has been the inability to assemble enough fire-qualified personnel to implement the burn during a small "burn window." Both the elevation of the savannah (which ranges from 3125 to 3560 feet) and the precipitation it receives annually (45-50 inches a year) is high. The growing season for vegetation in this savannah is short, from April through September. To obtain adequate fuel loads and achieve adequate burn intensities, the burn must be initiated while vegetation is still dormant yet precipitation is low. This time frame is often referred to as the "burn window," and at such high elevations, it is a very small "burn window" (usually between mid-April and late May).

Resources to Be Monitored

The following pages list the questions the ID Team sought to answer during its monitoring and summarizes their observations.

1. What, if any, vegetative changes have occurred in the savannah because of recent prescribed fires?
 - **Condition before the savannah was burned:** (See photos in Glady Range Allotment folder). The Beulah 1995 WMP described the area as containing more forested land than grassland. It contained a northern hardwood composition of maple species and beech. In portions of the savannah, hawthorn was so thick that it was limiting the distribution of grasses.

The following desirable forage existed in the area prior to burning: orchard grass, red and tall fescue, timothy, little bluestem, and white clover. Undesirable forage included: goldenrod, St. John's wort, yarrow, autumn olive, multiflora rose, Queen Anne's lace, moss, spotted knapweed, and velvet grass. Goldenrod and St. John's wort had been taking over the middle portion of the savannah.

The impacts prescribed burns had on St. John's wort and other species was monitored April 26, 1999 (see Bustamente's notes in project file). However, a specific assessment of the grasses was not done because none of the participants could clearly identify the desirable and undesirable forage.

- **Condition since savannah was burned in April 2000:** (See 8/7/00 photos of existing vegetation).

The team observed many types of vegetation in the savannah such as wild oat grass (*Danthonia*), blackberries, raspberries, various grass species, ferns, greenbrier, etc. In **both open and forested areas**, prescribed fires have –

- a. Burned back the greenbrier and fern. However, greenbrier and fern persist.



Figure 2. Fern persists in the Beulah Savannah after prescribed burning.

- b. Burned some smaller apple and hawthorn trees but not adversely affected the larger trees.
- c. Created ash that supplies nutrients and increased soil temperatures, both of which invigorate herbaceous vegetation.

In the more **open areas** of the savannah, the team noted that prescribed burns have –

- a. Top-killed some of the St. John's wort (a toxic weed) and goldenrod (an undesirable weedy species), but regrowth is still occurring.



Figure 3. St. John's wort and goldenrod have been impacted by prescribed fires but have not been eliminated.

- b. Caused blackberries (an early successional soft-mast producing plant) to thrive; as a result, they are likely to provide more berries in the future for wildlife.
- c. Not increased the growth or distribution of desirable grass species in the openings. This is probably because where sunlight is most intense, goldenrod, St. John's wort, and blackberries remain abundant, overtop, and out-compete desirable grass species. It may be too early to draw conclusions regarding the effects burns have on grasses and legumes.



Figure 4. Goldenrod continues to shade out grass species in the Beulah Savannah after prescribed burning.

In **forested stands** of the savannah, the team noted that prescribed burns have –

- a. Allowed desirable grass species to increase—improving their vigor and succulence. These grassy, savannah-type conditions likely resulted because goldenrod and St. John’s wort are not abundant in forested stands; also, fire is increasing the amount of light reaching the forest floor, reducing leaf litter, and reducing the vigor of encroaching beech saplings and other tree species.



Figure 5. Grassy vegetation is thriving in the understory of hawthorn stands within the Beulah Savannah.

- b. Helped thin the understory and mid-story canopy of existing stands. Some mid-story hawthorn has been killed, but they were hawthorns already overtopped by northern hardwoods.
- c. Created openings and increased light to the forest floor by approximately 20%.



Figure 6. Prescribed fires that have been implemented in the hawthorn stands have increased light to the forest floor.

- d. Altered the structure of vegetation in these areas to create forage, cover, and brood habitat that benefit wildlife such as wild turkey, bear, and deer. During the monitoring trip, the team saw signs of deer beds, deer browse, wild turkey feathers, a raccoon skull, etc.

All burns in the savannah have been conducted in April. The team noted that fires were more intense in openings and in the denser northern hardwood stands where dry leaf litter carried the fire well. Less intense fires occurred in forested stands with grassy understory conditions. These differences in intensity are presumably because of differences in moisture conditions and fuel availability.

Some of the prescribed burns, such as the one in 1999, were very intense, and scorch heights in forested stands averaged 4-5 feet. However, they did not burn hot enough to damage larger hawthorn or the tops of overstory saw timber and reduce the vigor of these trees.



Figure 7. View of scorch marks and top kill that were caused by prescribed fires in the Beulah Savannah.

The team monitored areas 1 and 2 and made the following observations: Fires in **Area 1** have successfully killed invading trees and shrubs. However, stump sprouting is occurring. Deer have been browsing on these sprouts, which will help retard their regrowth; however, to eliminate unwanted sprouting and vegetation such as St. John's wort and goldenrod herbicide may need to be used.



Figure 8. Stump sprouting that has occurred after prescribed burning in the Beulah Savannah.

- **Area 2** appears to have experienced a big change.

In about 1995, chainsaws were used to thin the overstory of Area 2; as a result, grassy vegetation became abundant in the understory (grass seed must have blown in from the streambank). In openings where chainsaw cutting occurred and bright sunlight had reached the understory, St. John's wort and blackberry exist. In more shaded areas, where no chainsaw cutting occurred, grass was abundant.

Before the 1999 burn, leaf litter was thick, but even so, the burn was not intense; a drip torch had to be used repeatedly to keep the burn going. Wet spots in Area 2, which did not burn well, have much taller St. John's wort than the drier areas, which burned hotter.

Hawthorn is denser now, but since this area was burned in 1999, grassy vegetation in the understory of the forested areas has increased, including clover. Area 2 has wild strawberry, yarrow, and mosses. Panicum grass, timothy, and orchard grass also exist, but in openings, these species continue to be shaded out by St. John's wort and goldenrod. Prescribed fires have set St. John's wort and goldenrod back, but they have resprouted and still have healthy root systems.

Some apple trees in Area 2 could benefit from release.

2. What effects have prescribed burns had on riparian areas and streambank stability?

Streams have been used as natural fire breaks during prescribed burns; and even though fires have burned into riparian areas, overstory riparian vegetation has not been adversely affected and understory vegetation recovers quickly. Riparian areas observed by the team contained hawthorn mid-story and maple overstory.

In regards to streambank stability, fresh signs of sloughing or erosion along streams were not evident; thus, removing livestock has helped streambanks stabilize and prescribed fires have not adversely impacted them.



Figure 9. A view of a spring seep that exists within the Beulah Savannah.

3. Have prescribed fires been implemented as planned? If not, what changes were made and why?

- *Prescribed fires were supposed to occur only within the boundary of the Beulah Savannah.* However, the vegetation and topography in some areas of the savannah is not conducive for establishing fire lines. Therefore, to conduct the burns more efficiently and safely, some control lines were placed along topographical features outside the savannah.



Figure 10. View of the fire line for the 1999 Beulah Savannah prescribed fire. The left side of the photo displays the area that was not burned. The right side of the photo shows the area burned, clearly depicting scorch marks and the understory and mid-story vegetation that were killed.

- The WMP was not clear as to whether 113 acres of hawthorn thickets were to be burned, so not all hawthorn in the allotment has been burned. The ID Team believes the intention was to have all acres of hawthorn burned. In places, hawthorn is too thick. Burning through the hawthorn may help thin the hawthorn thickets, reduce the basal area of hawthorn, and allow light to reach the ground to increase herbaceous understory.
 - Originally, the entire savannah was to be burned on a 3-5 year rotation. This has not been feasible for several reasons:
 - a. It has been difficult to achieve optimum burn conditions--all the burns that have been conducted in the Beulah Savannah have been spotty and needed nurturing to maintain them.
 - b. Few well-trained personnel have been available to conduct burns; therefore, only portions of the savannah can be burned annually.
4. Were prescribed fire management objectives met? Are prescribed burns having the desired effect? Why or why not? For example, some burns have been conducted during the green end of the burning window; take a close look at the effectiveness of these burns.

Neither the Beulah WMP nor the burn plan described the objectives of the burn in detail. To determine if prescribed fires are effective, vegetative objectives need to be clarified. The general objectives are to --

- Maintain 51 acres of existing openings and possibly to control/thin 113 acres of hawthorn thickets without adversely impacting water and soil resources.
- Increase desirable forage species and decrease undesirable forage species.
- Favor high value wildlife tree and shrub species (e.g. hawthorn, blackberries, etc.).

If the objective has been to maintain open areas, fires have helped accomplish the objective. However, if fires are supposed to be maintaining grasses and legumes (which are beneficial to grouse, turkey, deer, woodcocks, rabbits, raptors, owls, hawks, foxes, etc.) in areas where St. John's wort and goldenrod out-compete them, then the fires have not yet proven successful.



Figure 11. Prescribed burns have killed encroaching trees and helped maintain open conditions in the Beulah Savannah.

The group noted that regardless of the burn objective(s), adequate fuel must exist to support a burn. Fuels in the savannah don't build up fast enough to support annual burns; yet burns need to be implemented often enough to prevent undesirable vegetation from recovering from previous burns. Waiting two years for fuels to build up, but not more than three, may better meet burn objectives than burning on a 3-5 year schedule.

For example, Area 1 was burned on a two-year rotation and had some desirable effects. However, it might have had even better results (a more intense burn that would have set vegetation back further) if burning had been delayed an additional year. Also, it may have burned better if it had been burned during a different time of year; it was burned in April when vegetation had already starting to green-up.

The team discussed how much difference burning at a different time of year might make toward achieving the objectives of the burn. What difference would be made by burning earlier in the year, such as in February or March before the vegetation begins to green up versus burning in the fall. After some discussion, the team agreed that burning as early in the year as possible would improve the chances of meeting burning objectives but that burning in the fall would not be desirable for the following reasons:

- a. A fall burn would be more difficult to control because of too much fuel (tree cover or shed leaves);
 - b. Fall burns are less effective at accomplishing objectives because sugars are already stored in plants' root systems and the burn would not weaken the root system; and
 - c. It can be more difficult to get personnel together for a burn in the fall because of seasonal workloads.
5. Was NEPA documentation completed for the prescribed burns? Where mitigation identified in the Decision Memo? If so, document whether mitigations were implemented as planned and had the expected results.
- A decision memo was completed for the burn, but no mitigation was identified – except to notify people of the burn. Due to the general nature of the current objectives, mitigation isn't needed. However, if the objectives are narrowed, mitigation may need to be identified. The decision memo should be reviewed to determine if it is adequate to cover future burns or if additional NEPA should be conducted. The effects to threatened and endangered species should also be reviewed to determine whether threatened and endangered species conditions have been adequately addressed since the Regional Forester's sensitive species list was updated. If necessary, consult with USFWS.

6. Are Forest-wide standards and guidelines being followed? Are changes or additions needed to standards/guidelines? If so, document rationale for changes or additions.

| Table B: Assessment of Forest-wide Standards/Guidelines Compliance. | | | | | |
|--|---|---|--|-------------------------------------|---|
| Forest Plan Page #/FSM Reference | General Direction | Forest-wide Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation for Management |
| p. 49/1560 | B. Cooperate with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. | 1. Before initiating any land management activity, which might affect cultural resources, the Forest Service will consult with the SHPO and the ACHP as necessary to evaluate the significance of cultural resources and to determine the effect of proposed actions on significant properties. | Yes. The Forest Archeologist was consulted in regards to the burn. The burn was not expected to adversely affect heritage sites in the area. | No. | None. |
| p. 50/1560 | E. Cooperate in wildlife and fish resource management. | 1. Wildlife and fish resource management activities will be coordinated with the State Department of Natural Resources and the Fish and Wildlife Service, Department of Interior... | Yes. The WVDNR was consulted during the development of the Beulah Savannah Wildlife Management Plan and were in agreement with using prescribed fire to help maintain the savannah. USFWS was consulted when NEPA was completed. | No. | Set up a meeting with WVDNR to discuss the findings from this monitoring trip and/or mail copies of the report for their information. |
| p. 56/1900 | D. The management of specific woody non-timber or herbaceous plant species will be coordinated with the primary land use objectives for each Management Prescription. | | See response to MP 6.1 standards and guidelines. | No. | None. |

Table B: Assessment of Forest-wide Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | Forest-wide Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation for Management |
|--|---|--|---|------------------------------------|--|
| p. 56/1950 | A decision to implement any action that could affect resources, land uses, and environmental quality shall be proceeded by an Environmental Analysis... | 3. Projects...will receive Environmental Analysis consideration appropriate to their magnitude and complexity. | Yes. The Beulah prescribed fires were to improve wildlife habitat quality. They were categorically excluded under FSH 1909.15, 31.2(6). A project file has been maintained as required, however, the last Decision Memo was completed before the first fire in 1998. | No. | Revisit the last decision. Determine if it is adequate, needs to be updated, or if a new decision is needed. Conditions do not appear to have changed, but the biological evaluation may need to be updated to address changes to the Regional Forester's sensitive species list. |
| | | 5. Economic analysis, as appropriate, will be a normal part of the Environmental Analysis procedure. | Yes. A rough estimate of the economic costs was completed (see attached narrative). | | Track the actual costs of prescribed burns so that they can be compared to the estimated costs. This would be helpful for <i>Forest Plan</i> monitoring and determining the efficiency of burns. |
| | | 6. Public involvement, as appropriate, will be a normal part of the Environmental Analysis procedure. | Yes. Public participation was completed when the original decision for the burn plan was completed in 1998. At that time, adjacent landowners were informed, a legal notice was put in the paper, and a notice was posted at the Gladys Post office. | | When the NEPA decision is revisited for the next burn, inform the public and provide them an opportunity to comment. |

Table B: Assessment of Forest-wide Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | Forest-wide Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation for Management |
|--|---|--|---|------------------------------------|----------------------------------|
| p. 57/2120 | A. The Forest will seek to control air pollution from its land management activities to maintain air quality at a level that meets or exceeds all applicable Federal and State standards. | <ol style="list-style-type: none"> 1. Comply with all substantive and procedural requirements of Federal and State authorities. 2. Coordinate with air quality regulatory authorities on impacts of air pollution on National Forest resources, and preventive practices to control any significant emissions resulting from National Forest management activities. 3. Prescribed burning proposals for vegetation management will be coordinated with the West Virginia Air Pollution Control Commission to assure minimum impacts to air quality. | <p>Yes. The WV Environmental Protection Agency was notified, and a burn permit was obtained from the WV Division of Forestry.</p> <p>The State did not have any concerns unless the Forest was going to burn heavy slash.</p> | No. | None. |
| p. 70/2360 | B. Protect historic, archaeologic, and cultural resources from preventable damage... | <ol style="list-style-type: none"> 2. Conduct cultural resource surveys and needed evaluations in all areas to be affected by...earth disturbing activities and design action to avoid, minimize, or mitigate adverse effects. 3. Known sites will be protected from preventable damage, as much as practical. | Yes. See response on previous page. | No. | None. |
| p.79/2500 | A. Protect water and soil resources...Minimize non-point pollution to the maximum extent, technically and economically feasible... | <ol style="list-style-type: none"> 1. Where activities may expose mineral soil, filterstrips will be required on all watercourses which have formed a functioning channel... 3. Disturbed soils must be protected by fertilizing, liming, seeding, and/or mulching as soon as possible after project completion... | <p>Yes. Mineral soil was not noticeably disturbed. See photo of fire line.</p> <p>Fertilizing, liming, seeding and mulching were not needed because mineral soil was not noticeably</p> | No. | None. |

Table B: Assessment of Forest-wide Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | Forest-wide Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation for Management |
|--|---|--|---|------------------------------------|--|
| | | | was not noticeably impacted by prescribed fire actions. The fire line was <12 inches wide. On the day of the monitoring trip, the fire line was barely visible; it had healed naturally and did not need seeding, liming, or fertilizing. See fire line photo. | | |
| p. 83/2620 | A. Fish and wildlife habitat will be managed to maintain viable populations of all existing native vertebrate species and to maintain or improve habitat of management indicator species. | 1. Indicator species used for monitoring wildlife populations are: Indiana bat, Big-eared Bat, Cheat Mountain Salamander, Wild Trout, Black Bear, Turkey, Varying Hare, Gray Squirrel, White-tailed Deer, Northern Flying Squirrel. | Yes. Prescribed fires have been beneficial to wildlife that require open habitat, a habitat element that is rare on the Forest. Forested habitat is abundant in this area and across the Forest, thus fires have not noticeably affected species that prefer forested habitat. | No. | The objectives for managing the structure of vegetation in each area of the savannah could be narrowed and clearly stated. |
| p. 84/2670 | A. Management will protect or enhance habitat for threatened and endangered species and consider the needs of species identified as special or unique. | 1. Management of habitat critical to endangered and threatened wildlife and fish species is considered the first priority management activity... 3. Sensitive, unique, or special plants or animals will be considered in the design of projects... | Endangered and threatened species conditions were assessed when the original analysis was completed. | No. | Review the Biological Evaluation and implement any changes necessary. |

Table B: Assessment of Forest-wide Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | Forest-wide Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation for Management |
|----------------------------------|---|---|--|------------------------------|--|
| p. 87/2670 | B. Sensitive wildlife species will be afforded the highest possible protection commensurate with other appropriate uses and benefits. | <ol style="list-style-type: none"> 1. A survey for sensitive species will be done during and as part of normal project reconnaissance and design. 2. If sensitive species are found, mitigation measures will be made part of the project design. | Sensitive species conditions were assessed when the original NEPA analysis was completed. | No. | Review the Biological Evaluation and implement any changes necessary. |
| p. 87/2670 | C. Riparian Management will protect and enhance habitat for wildlife species and consider the needs for species identified as Threatened, Endangered, Special, or Unique. | <ol style="list-style-type: none"> 1. Endangered bat foraging habitat includes riparian land and vegetation approximately 100 feet wide along both sides of streams, which are at least 30 feet wide as of June 15. Included are aquatic ecosystems, floodplains, riparian ecosystems, and wetlands... <ol style="list-style-type: none"> a) Protect all standing dead trees... b) Protect living loose bark trees such as hickories, elms, oaks, and sycamores. 2. Protect hollow trees and den trees whether living or dead. | <p>Prescribed burns have killed some understory saplings and seedlings along the stream. However, overstory vegetation has not been adversely affected. (see previous comments regarding riparian vegetation).</p> <p>Understory vegetation has reestablished after the burns.</p> | No. | To avoid any impacts to riparian vegetation, a control line could be created away from the water, but considering the minimal impact that has been seen so far, it may not be necessary. |

7. Are Management Prescription 6.1 objectives being met? Why or why not?

The primary purpose of MP 6.1 is to emphasize remote habitat for wildlife species intolerant of disturbance (Forest Plan, pp. 164-165). Lands assigned to this prescription should have the basic components of the habitat needs for the Wild Turkey and Black Bear Associations. The Forest area will be a mosaic of tree stands and openings with a near optimum quantity and dispersion of the habitat elements that feature the wild turkey and black bear along with associated wildlife species...Normal forest management activities will be used to achieve vegetative diversity that will enhance habitat of the wildlife species being featured..."

The prescribed fire of the Beulah Savannah helped meet the 6.1 objectives for the area by helping to maintain the existing savannah and improving the vigor of blackberries and other vegetation that species in the Black Bear and Wild Turkey Associations need for food, cover, and nesting. See previous comments regarding existing vegetation.

8. Are forest-wide and 6.1 standards and guidelines being followed? Are changes or additions needed to standards/guidelines? If so, document rationale for changes or additions.

Table C: Assessment of MP 6.1 Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | MP <u>6.1</u> Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation |
|---|---|--|--|---|---|
| p. 166/1900 | A. Diversity of Forest Vegetation cover will be enhanced by the dispersion of a variety of species, types, and ages. | 1. In MP 6.1, the following guidelines apply to Compartments. The intent is to ultimately provide each element of vegetation diversity within the normal home range of wild turkey. Elements of diversity will therefore, be dispersed throughout the compartment (or compartment sized area)...At least five percent of the Gross Area of the OA should be in permanent openings. Road clearings, landings, fields, special uses, and private lands may contribute to this amount of opening. | Yes. Fires in the Beulah Savannah have helped ensure that openings within the Little Beech Mountain Opportunity Area are maintained. | No. | None. |
| p. 176/2620 | A. Wild turkey and/or black bear and associated species will be featured on lands assigned to this Management Prescription. | NA. | Yes. Prescribed fire is maintaining or improving conditions for featured species. See previous comments. | No. | None. |
| p. 177/2630 | A. Wildlife habitat will be managed in cooperation with Department of | 1. Permanent openings will be created and maintained in coordination with other resource projects, to provide an | Yes. See previous responses. | No. | Set up meetings with WVDNR to discuss the findings from this monitoring |

Table C: Assessment of MP 6.1 Standards/Guidelines Compliance.

| Forest Plan Page #/FSM Reference | General Direction | MP <u>6.1</u> Standard/Guideline | Was It Implemented? If Not, Why? | Need for Change in Standard? | Recommendation |
|--|--|--|---|------------------------------------|--|
| | Natural Resources. | <p>element of vegetation diversity. Mechanical, chemical, prescribed fire, or grazing may be used for the maintenance of permanent openings.</p> <hr/> <p>2. Roads intended for intermittent use will be revegetated between uses and managed as wildlife habitat.</p> <hr/> <p>3. Provide for the retention of dead and down logs and other ground material necessary to maintain viable populations of indigenous species such as reptiles and amphibians.</p> | <hr/> <p>No roads were constructed and the existing trail used to access the area was not adversely affected by burn activities (see West Fork Trail photo).</p> <hr/> <p>Adequate ground material persists in the savannah (see photos).</p> | | trip and/or mail copies of the report for their information. |
| p. 179/2670 | A. Threatened and Endangered species will be managed to ensure their protection. | 1. Standards and guidelines for T & E species are found in the Forest-wide standards and guidelines. | See previous response regarding T&E. | No. | Review the BE and update as necessary. |
| p. 181/5100 | A. Prescribed fire may be used to establish, maintain, or control vegetation. | 1. An approved burning plan is necessary. Project proponent will prepare EA to justify the prescribed burning. | A burn plan was prepared and approved. See the report in the project file. | No. | None. |
| p. 181/5100 | B. Activity fuels will be managed at a level commensurate with the allowable fire intensity and rate of spread that meets resource objectives. | 1. Treatment along highways and adjacent properties will meet applicable state laws. | The fires did not affect highways. Adjacent landowners were notified and present in 2000. | No. | None. |

Conclusions and Recommendations

In regards to prescribed burning of the Beulah Savannah, the team recommends that the following items be pursued as time and budgets allow:

Table D: Items to be followed-up on in regards to prescribed burning of the Beulah Savannah.

| | <u>Recommendation</u> | <u>Date Accomplished</u> | <u>Signature</u> | <u>Comments?</u> |
|----|--|---------------------------------|-------------------------|-------------------------|
| 1. | Consider amending the Wildlife Management Plan for the Beulah Savannah to include definitive objectives for prescribed burns. The objectives for managing the structure of vegetation in each area of the savannah could be narrowed and clearly stated. It appears that the objectives of prescribed fire in the savannah are not clear. Is the objective just to maintain an opening; is it to maintain grassy species, or what? | | | |
| 2. | Map the perimeter of the savannah; delineate the open areas from the forested areas; and identify the areas that have been burned. Clearly identifying these boundaries would enable the Forest to determine how fires over the years are affecting their size and shape. | | | |
| 3. | Set up monitoring that will help the Forest determine if the objectives for prescribed burns in the Beulah Savannah are met. No measurements have been taken of any vegetation type to know the quantitative impacts of previous burns. Also, no photo points have been established to document qualitative impacts. The team recommends that photo points be established and photos be taken from the same location, at the same time of year on a reoccurring basis (but not necessarily every year). Weather conditions should be documented and the size of vegetative patches could be measured with a GPS unit over time. | | | |
| 4. | Identify a timeline for completing the projects that were listed in the Beulah Wildlife Management Plan and incorporate these projects into the District's program of work. | | | |
| 5. | Burn areas in the savannah every other year or after two years instead of on an annual or 3-5 year rotation. This type of rotation should continue to reduce the vigor of undesirable vegetation and is more likely to | | | |

Table D: Items to be followed-up on in regards to prescribed burning of the Beulah Savannah.

| | <u>Recommendation</u> | <u>Date Accomplished</u> | <u>Signature</u> | <u>Comments?</u> |
|----|---|---------------------------------|-------------------------|-------------------------|
| | <p>eventually kill undesirable vegetation.</p> <p>Burning annually does not allow enough fuel to build up to sustain the intensity of fire needed to meet burn objectives. Burning on a 3-5 year cycle may allow burned (but not killed) vegetation to recover; disturbance must be sustained to prevent vegetation from sprouting back.</p> | | | |
| 6. | <p>Consider using prescribed fire as a management tool in allotments where cattle grazing may be resulting in undesirable effects (environmental, social, or economic).</p> <p>Evaluate the site-specific conditions on each allotment (e.g. kind and amount of fuel, topography, condition of vegetation, etc.) to determine if prescribe fire would meet management objectives.</p> <p>It is unlikely that burning could be effectively implemented on allotments that had been grazed the previous year because fuel would not be adequate. Also, most allotments contain cool season grasses that are more difficult to burn in the spring or fall.</p> | | | |
| 7. | <p>Investigate methods of management that will best kill autumn olive, St. John's wort, goldenrod, and multiflora rose.</p> <p>Review literature and establish a monitoring protocol (e.g. photo points or measured plots, etc.) to evaluate how the Forest's fire management in the Beulah Savannah is impacting autumn olive, St. John's wort, goldenrod, and multiflora rose.</p> <p>The ID Team is not convinced that fire management as implemented on the savannah in the past will kill these species. The team noted fire management in the savannah has only killed the tops of these species. Adjustments in our fire management practices may be needed. Brush hogging, using herbicide, or mechanically cutting these species may work better than fire, or in combination with fire.</p> | | | |
| 8. | <p>Consider mechanically cutting hawthorn before burning to increase fuel and the burn intensity.</p> | | | |

Table D: Items to be followed-up on in regards to prescribed burning of the Beulah Savannah.

| | <u>Recommendation</u> | <u>Date Accomplished</u> | <u>Signature</u> | <u>Comments?</u> |
|----|---|-------------------------------------|-------------------------|-------------------------|
| | Would mechanical cutting hawthorn and trees be less expensive than prescribed fire? The team observed how fire had eliminated some hawthorn seedlings and hawthorn on the edges of the openings, but wonders if it is realistic to believe fire will thin larger hawthorn in dense stands without damaging residual hawthorn. More burns are needed to kill hawthorn, including sprouts. | | | |
| 9. | When conducting prescribed fires for other projects across the Forest, identify the location for fire lines only after considering the topography, environmental conditions, and costs of creating them. Burn patterns and burn intensity are affected by multiple factors; depending on conditions, it may not be feasible to stay within planned boundaries, especially if the boundaries do not take into account the topography and aspect of the area being burned. | | | |
| 10 | Consider revising <i>Forest Plan</i> standards to allow prescribed fire in areas that cannot be managed under other means of vegetative management. Currently, the Forest Plan does not allow prescribed fire in 6.2 areas. It may be something the Forest would want to consider using to maintain openings in areas such as those that are not easily accessible for mowing or brush hogging, or those that are not well suited for grazing. | | | |
| 11 | Some apple trees in Area 2 could benefit from release. Coordinate with WVDNR to see if they would conduct the release. | | | |
| 12 | Track the actual costs of prescribed burns so that they can be compared to the estimated costs. This would be helpful for <i>Forest Plan</i> monitoring and to determine the economic efficiency of conducting prescribed fires. In 1999, approximately \$4,100 was spent to burn 141 acres of the Beulah Savannah. Is this the standard cost or have costs declined as personnel were trained and became more skilled? The team discussed whether it is more or less expensive to use fire instead of | | | |

Table D: Items to be followed-up on in regards to prescribed burning of the Beulah Savannah.

| | <u>Recommendation</u> | <u>Date Accomplished</u> | <u>Signature</u> | <u>Comments?</u> |
|----|---|-------------------------------------|-------------------------|-------------------------|
| | domestic grazing to meet management objectives. | | | |
| 13 | Revisit the NEPA decision for prescribed fires in the Beulah Savannah. Determine if it is adequate, needs to be updated, or if a new decision is needed. | | | |
| 14 | When the NEPA decision is revisited for the next burn, inform the public and provide them an opportunity to comment. | | | |
| 15 | Review the Biological Evaluation and implement any changes necessary. Conditions do not appear to have changed, but the biological evaluation may need to be updated to address changes to the Regional Forester's sensitive species list. | | | |
| 16 | Consider whether a control line needs to be created to avoid any impacts to riparian vegetation. Considering the minimal impact observed by the team, it may not be necessary. | | | |
| 17 | Set up a meeting with WVDNR to discuss the findings from this monitoring trip and/or mail copies of the report for their information. | | | |

/s/ Laura Hise

Laura Hise
Assistant Forest Planner
Supervisor's Office,
Elkins

/s/ Kenneth L. Rago

Kenneth L. Rago
District Ranger
Greenbrier Ranger District

Attachment 1

Cost Analysis

An intuitive economic analysis has been done, but the Forest has not determined whether burning is more economical for keeping areas open than domestic grazing. Range and wildlife funds are not abundant, but the Forest receives hazardous fuel funds that can be used to achieve multiple objectives.

The first fire conducted in the Beulah Savannah occurred in 1998. Approximately 20 Forest Service personnel and WV Division of Natural Resources personnel participated. This burn cost about \$4,100 to complete. It helped meet the management objectives for the Beulah Savannah, but it had the added benefit of training a cadre of people.

In the spring of 2000, wildlife money was used to burn the savannah. About 10 personnel participated in the burn. In the future, the anticipated cost is expected to be \$1,000 for a 6-7-person crew for one day.

In 1999, wildlife money was used to fund the fire. Few acres were burned for the dollars spent, but it provided a training opportunity.

The Forest anticipates that for \$1,000, about 100 acres can be burned in the future.

It costs more to create new openings (\$2,500 to \$3,000 per acre?) than to maintain existing openings (approximately \$1,000 per acre).

At least for the Beulah Savannah, burning may be the best way of protecting riparian habitat and the most economical method of maintaining open habitat.

It would cost approximately \$20,000 to \$30,000 to replace deteriorating fences and install fence around the long, linear riparian areas that exist within the savannah. These fences might last approximately 30 years with normal annual maintenance, but this is not guaranteed since fence maintenance has been difficult to accomplish as needed.

The treasury would annually receive income from grazing fees if someone chose to rent this allotment; however, considering the poor vegetative condition of the allotment, and the amount of fence that would have to be maintained by the permit holder in comparison to the few acres of land that could be grazed, it is unlikely that anyone would bid on this allotment. Also, grazing alone cannot maintain an area in a non-forest/herbaceous condition. Livestock do not eat certain plants, such as woody vegetation. A combination of grazing, mowing, chainsaw cutting, and/or herbicides would be needed to completely retard forest succession.